

A NEW SPECIES OF BRITTLE-STAR (ECHINODERMATA, OPHIUROIDEA) FROM
NORTHERN NEW SOUTH WALES.

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(Plate xvii; one Text-figure.)

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Synopsis.

Ophiocoma alternans, sp. nov., from northern N.S.W. is described and figured.

Amongst echinoderms collected at Hastings Point near the New South Wales-Queensland border were specimens of an undescribed species of *Ophiocoma*.

Family OPHIOCOMIDAE Ljungman, 1867.

Genus OPHIOCOMA Agassiz, 1836.

OPHIOCOMA ALTERNANS, sp. nov.

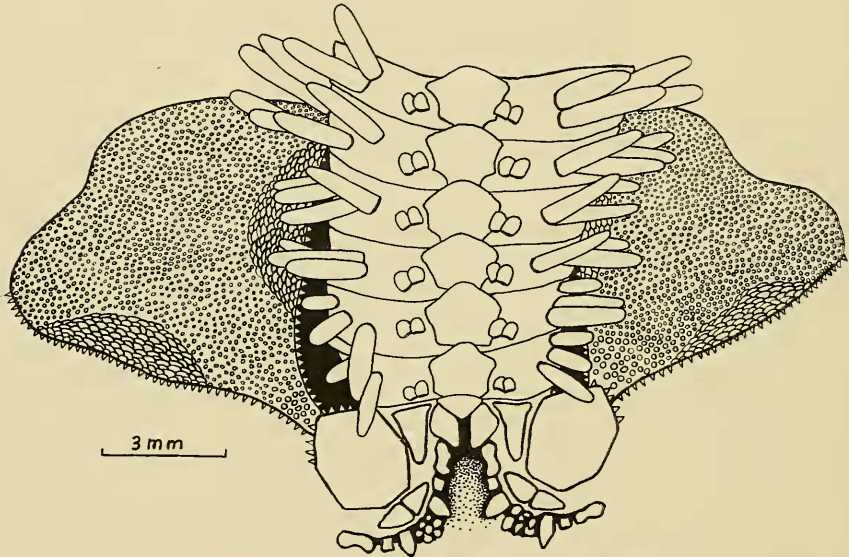
Dimensions: Disc diameter, 21 mm.; average length of arms, 75 mm.

Disc: The disc is essentially circular in outline but a slight cleft is present at each interradius. Coarse granules cover the upper surface of the disc and hide the radial shields. The granules are more crowded near the margin of the disc than they are near its centre. Thus there are approximately 20 granules per square mm. near the centre of the disc and approximately 30 granules per square mm. near its margin. Distally, interradial areas on the lower surface of the disc are well covered with similar granules, but proximally the granules become enlarged and pointed. A small area of the disc on the interradial side of each genital cleft is devoid of granules and small overlapping scales are exposed. A single row of pointed granules is found along the interradial border of each genital cleft, and the distal edge of each oral shield is fringed with such granules. The genital clefts are long, extending almost to the margin of the disc. The oral shields are ovoid in outline, but tend to possess a straight proximal edge. The adoral plates are longer than wide and are well separated from each other. There are three oral papillae on each side of each jaw. The first oral papilla is wider than high, curved, and is the largest of the three. The second oral papilla is small and blocklike, and the larger third papilla is pointed. A cluster of tooth papillae is present at the apex of each jaw. Oral shields, adoral plates and oral papillae are covered with very fine granules.

Arms: Near the disc, each lower arm-plate is wider than long and is shaped as illustrated in Text-figure 1, the distal border being convex, the proximal border straight and the lateral borders concave. Towards the tip of each arm the lower arm-plates become longer than wide. The lower ends of each pair of lateral arm-plates are interposed, to some extent, between the lower arm-plate of their arm-segment and the lower arm-plate carried on the preceding arm-segment. This narrows the area of contact between successive lower arm-plates. Near the disc, each lateral arm-plate carries two tentacle scales which are equal in size. Distally, the innermost tentacle scale becomes smaller, then disappears, only a single tentacle scale being carried by arm-segments near the tip of each arm. Each lateral arm-plate bears at least three stout arm-spines which are curved away from the disc. The lowermost arm-spine is compressed laterally and is about two and one-half times the length of the arm-segment which bears it. The next arm-spine is similar but slightly longer. The uppermost arm-

spine is cylindrical and three to four times the length of the arm-segment upon which it is carried. Many lateral arm-plates carry four arm-spines. In such cases the uppermost arm-spine is swollen, elongated (about five times the length of the segment which bears it) and directed towards the tip of the arm. These arm-spines are, for the most part, cylindrical, but an occasional spine is slightly enlarged distally. Near the disc each arm-segment bears two of these swollen arm-spines, one to each lateral arm-plate. Distally, the swollen spines are usually carried on alternate sides of each arm, one spine being present on one of the lateral plates of every second successive arm-segment. The upper arm-plates are fan-shaped and broader than long. Proximally, successive arm-plates are contiguous, but distally they are separated by upward extensions of the lateral arm-plates. All the arm-plates and arm-spines are covered with very fine granules.

Colour: The upper surface of the disc is black. The upper surfaces of the arms are irregularly banded with purplish-black and greyish-brown. The lower surfaces of the arms are brownish. All the arm-spines are indistinctly ringed with purplish-black. The lower arm-spines are greyish, and the upper arm-spines are greyish-brown. The colour fades only slightly in alcohol.



Text-fig. 1. *O. alternans*, sp. nov., adoral aspect.

Types: Holotype, No. J7344; 23 paratypes. All are in the Australian Museum, Sydney.

Type locality: Hastings Point, northern N.S.W., under boulders in rock pools near L.W.N. (16/4/1961).

Variation: The 24 specimens collected range in size from 17 to 24 mm. in disc diameter and have an average size of 21 mm. The average length of the arms is 3.6 times the disc diameter. The average number of granules per square mm. near the centre of the disc is 19 and near the periphery of the disc the average number is 30. The oral shields vary from almost circular to subpolygonal in outline. Two specimens possess five spines on arm-segments near the disc, and five specimens possess three tentacle scales on arm-segments near the disc. Usually, swollen arm-spines are carried by both members of each pair of lateral plates on the first six arm-segments distal to the disc. Then the swollen arm-spines are usually carried on alternate sides of each arm at intervals of two, sometimes three, arm-segments. These spines are never clavate, but occasionally possess slightly swollen tips.

Remarks: Because of the possession of spherical granules on the upper surface of the disc, partially bare interbrachial areas on the lower surface of the disc and a dark variegated colouring, *O. alternans* belongs to a group of *Ophiocomas* designated the *scolopendrina* group by Clark (1921). It is closely related to both *O. erinaceus* Muller and Troschel and *O. scolopendrina* (Lamarck). However, it can be distinguished from both these species by the following features:

1. The granules on the upper surface of the disc are not as coarse in *O. alternans* as they are in the other two species.
2. The greater part of each interbrachial area is covered by granules in *O. alternans* whereas such areas are usually devoid of granules in the other two species.
3. The size, shape and arrangement of the arm-spines in *O. alternans* differ markedly from those of *O. erinaceus* and *O. scolopendrina*.
4. The coloration is different.
5. The arms of *O. alternans* are shorter, relative to disc diameter, than they are in the cases of specimens of *O. erinaceus* and *O. scolopendrina*.

The arrangement of the swollen and elongated arm-spines of *O. alternans* recalls the arrangement of the clavate arm-spines of the genus *Ophiomastix*, but spines are totally absent from the disc of *O. alternans*, and the arm-spines of this species are never clavate. Moreover, the geographical position of *O. alternans* makes it unlikely that it can be regarded, in any way, as a connecting link between the genera *Ophiocoma* and *Ophiomastix*. The bulk of species belonging to these two genera are tropical in distribution.

It is noteworthy that the arm-spines of *Ophiocoma occidentalis* Clark, which is found on the opposite side of the Australian continent, closely resemble the arm-spines of *O. alternans* in shape and size and, to some extent, in their arrangement on the arms. However, other structural features of taxonomic significance enable the species to be separated readily.

O. alternans has been found recently at Caloundra in southern Queensland, but it does not occur on the Queensland coast north of the biogeographical boundary at Lat. 25° S. The southern limits of its range are not known. Two species of *Ophiocoma* (*O. canaliculata* Lutken and *O. pulchra* Clark) have been recorded from the southern half of the Peronian Province. These species differ markedly from *O. alternans*. It would appear therefore that *O. alternans* is restricted to the northern part of the Peronian Province.

Reference.

CLARK, H. L., 1921.—The Echinoderm Fauna of Torres Strait: Its Composition and its Origin. *Publ. Carneg. Instn. Dept. Mar. Biol.*, 10, No. 214: 1-244.

EXPLANATION OF PLATE XVII.

- Fig. 1. Upper surface of *O. alternans*, sp. nov. × 5/7.
 Fig. 2. Lower surface of *O. alternans*, sp. nov. × 5/7.